CoreTigo®

TigoBridge Manual

Revision 2.0

April 1, 2020

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Revision Control

Author Name	Description	Revision	Date
Ofri Olinky	Creation	1.0	04/02/19
Rob Goldman	Update	2.0	23/03/2020

Table 1 - Revision control

Acronyms and Abbreviations

Acronyms and abbreviations used in this document are listed in the table below

Term	Meaning
IF	Interface
IOLW	IO-Link Wireless
HW	Hardware
SW	Software
FW	Firmware
MCU	Micro Controller Unit
UID	Unique ID

Table 2 - Acronyms and Abbreviations

1 Introduction

This document presents CoreTigo IO-Link Wireless Bridge.
This manual will introduce you to the TigoBridge, learn how to use the TigoBridge & understand its indications.
Please read the manual very carefully before starting to use the device.

Figure 1 - TigoBridge

2 Safety instructions

- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose.
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.

3 Overview

The TigoBridge is an IO-Link Wireless Class A Bridge with IP67 Enclosure.
The TigoBridge converts IO-Link to IO-Link Wireless. The TigoBridge houses internal antenna and two M12 connectors for data and power.
TigoBridge is a device that connects a wired IO-Link device via IO-Link Wireless to an IO-Link Wireless Master/Gateway.

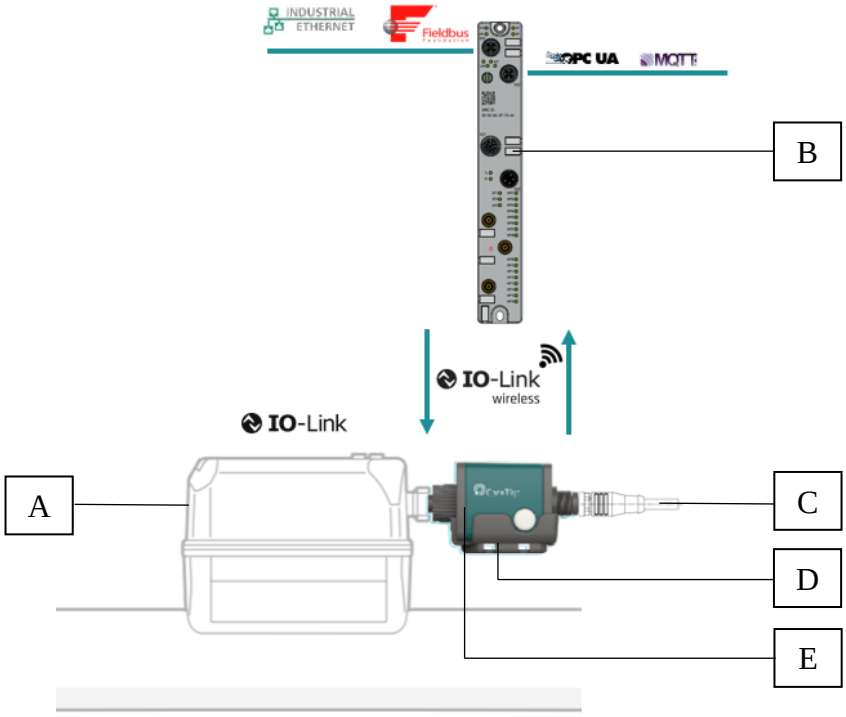

Figure 2 - TigoBridge Overview

A. IO-Link Device
B. IO-Link Wireless Master (See appendix A for IO-Link Wireless Masters alternatives)
C. TigoBridge Power Supply – 24VDC
D. Mounting Accessory – TigoBridge Cradle
E. TigoBridge

3.1 Functional Diagram

Figure 3 - TigoBridge functional diagram

A. Device Connection
B. Paring Button
C. Power Supply Connection
D. Status LED (RGB)
E. Power LED (Green)

Figure 4 - TigoBridge Label

Label

A. Model Number
B. Product Number
C. Serial Number (Sticker)
D. UID – TigoBridge UID Code, UID QR Code and UID Barcode (Stickers)
E. Input Power Supply Range
F. TigoBridge Pin-Out
G. FCC ID

3.2 LEDS

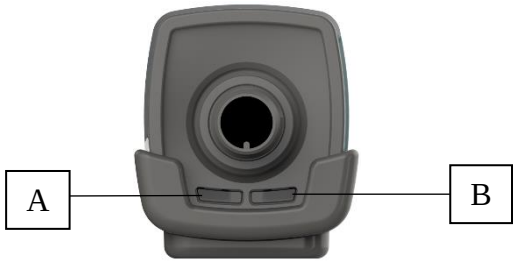

Figure 5 - TigoBridge LED View

A. Power LED (Green)
B. Status LED (RGB)

3.2.1 Power LED

LED Color	Indication
Green	Power supply connected

Table 3 - Power LED

3.2.2 Status LED

LED Color	Indication
Magenta	Unpaired wireless
Blue	Paired wireless
Green	Operational wired device
Yellow	Non-operational wired device
White	Wireless Error[1]
Blinking Green	Firmware update mode

Table 4 - Status LED

3.3 Pair by Button

Pairing by button can be used to replace existing TigoBridge with a new one.
The TigoBridge must be powered off to assure that the TigoMaster disconnects before replacing it with a new TigoBridge. [2]

[1] Contact CoreTigo support
[2] Pairing by button is currently disabled. If pairing by button feature is required contact CoreTigo support.

3.4 Electrical Wiring

TigoBridge has two M12 connectors.

- IO-Link connector: 5 pins, female connector.
  Temperature range: -40C° - +85C°.
  Note: Maximum Current supply to IO-Link device is 1A when using 24VDC.
- Power connector: 5 pins, male connector.
  Temperature range: -40C° - +85C°.
  Note: Higher voltage than 32VDC might damage the TigoBridge.

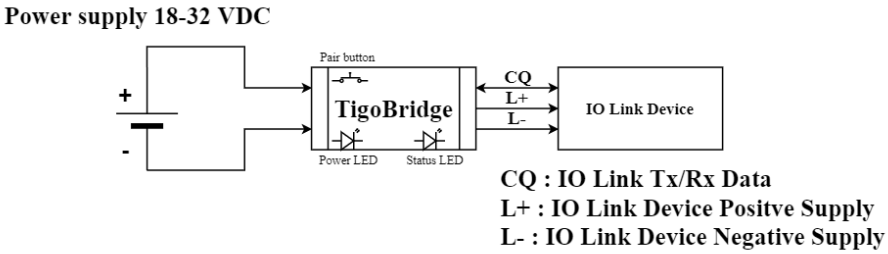

Figure 6 - Electrical Schematic Diagram

4 Mounting

4.1 Cradle

TigoBridge should be mounted safely next to the device.
The cradle designed to help mount the TigoBridge on flanges.
Cradle can be mounted to the flange/wall using cable ties or M3 screws.

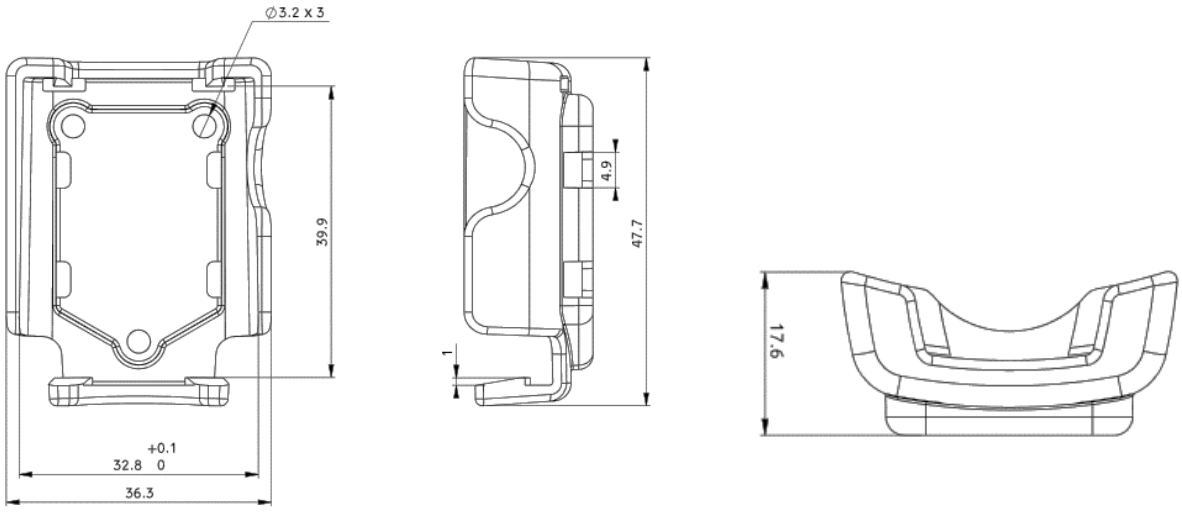

Figure 7 - Cradle Dimensions

Figure 8 - TigoBridge and Cradle

Figure 9 - TigoBridge mounted on the cradle

4.2 Mounting the TigoBridge

- TigoBridge can be mounted using the cradle on a flange.
- Secure the cradle location on the flange using M3 screws.
- Mount the TigoBridge on the cradle by pushing it in.
- Unmounting is done by pulling the TigoBridge from the cradle.

5 Configuration & Setup

Pre-Commissioning Requirements:

- TigoEngine software installed and running on the working PC.
- TigoMaster/TigoGateway successfully connected to PC.

Installation:

1. Plug 24VDC power supply to TigoBridge M12 power connector via M12 cable.
2. The Power LED will light up green. If not, please verify the power connection.
3. Once power supply connected, a reset cycle occurs. The reset cycle lasts for few seconds and shows red→green→blue color sequence.
4. Once the reset cycle is done, the status LED will alternate between magenta and yellow.
5. Plug TigoBridge to an IO-Link device (sensor/actuator). Note, if TigoBridge cannot connect directly to the device, you may use an M12 cable. Once connection done successfully the Status LED will alternate between Magenta and Green.
6. Open TigoEngine, scan the network for the IO-Link Wireless TigoBridge.

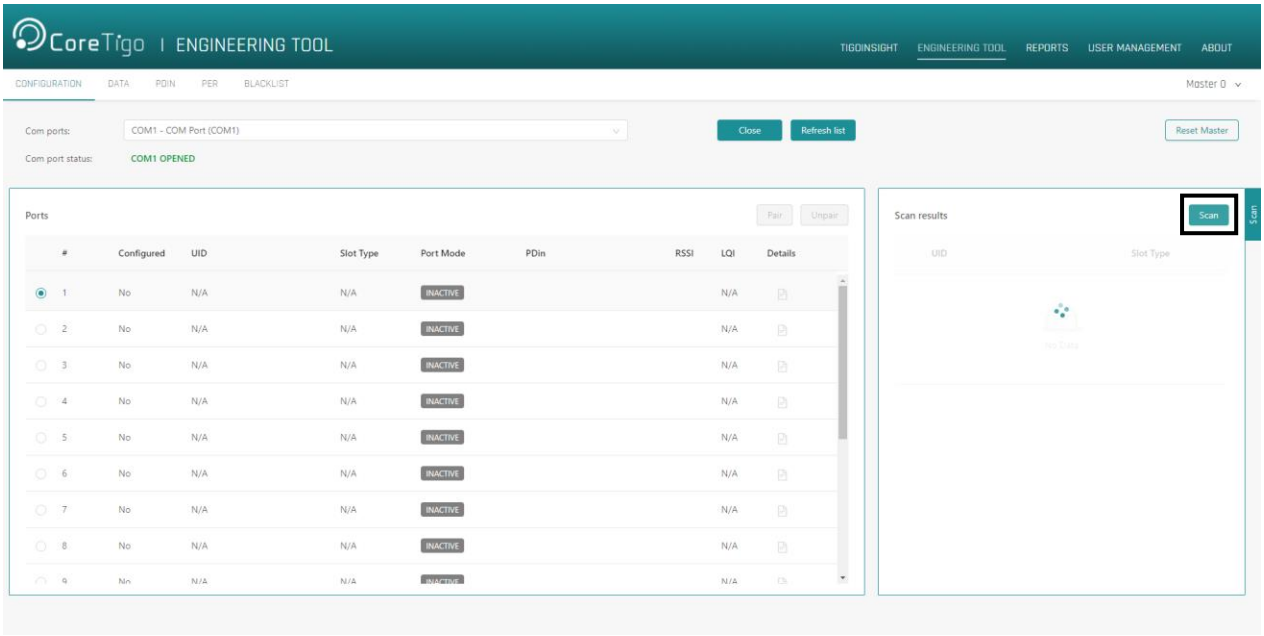

Figure 10 - TigoEngine Scanning Mode

7. Identify the TigoBridge using the UID. Select the requested TigoBridge[1]. Select an empty port on the master side[2] and press "*Pair*"[3].

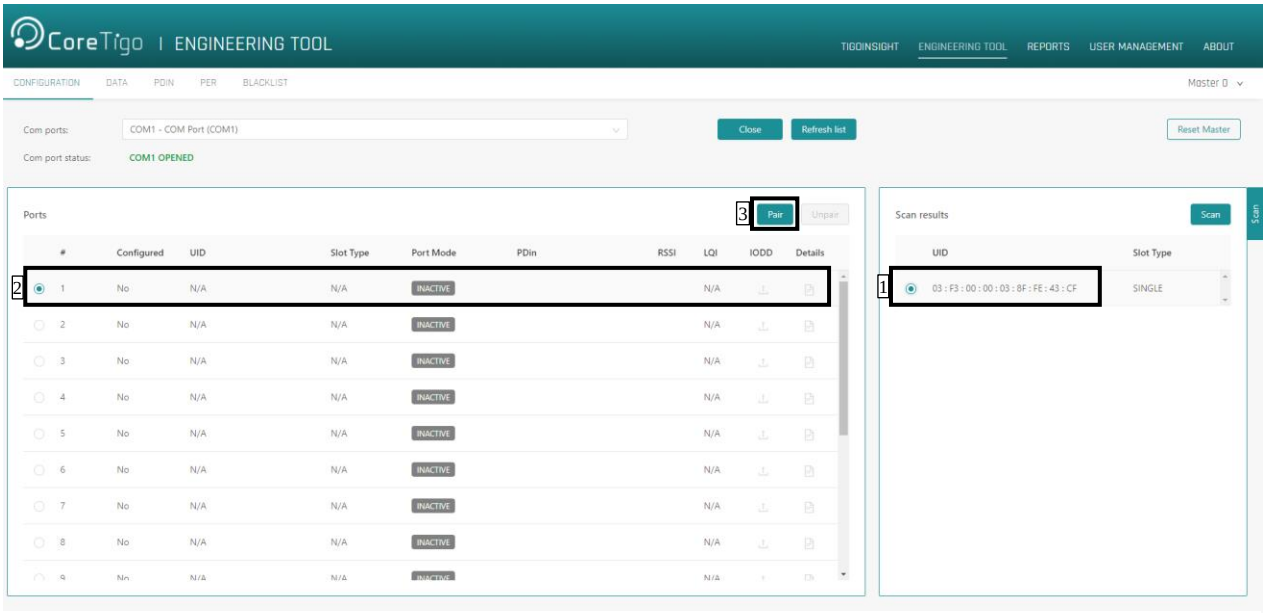

Figure 11 - TigoEngine Pairing Process

8. Once the pairing process done successfully, TigoEngine "Port Mode" should indicate "OPERATE**".** TigoBridge Status LED will alternate between blue and green.
   Connection successfully established.
   Configuring the IO-Link device can be done through the DATA tab.

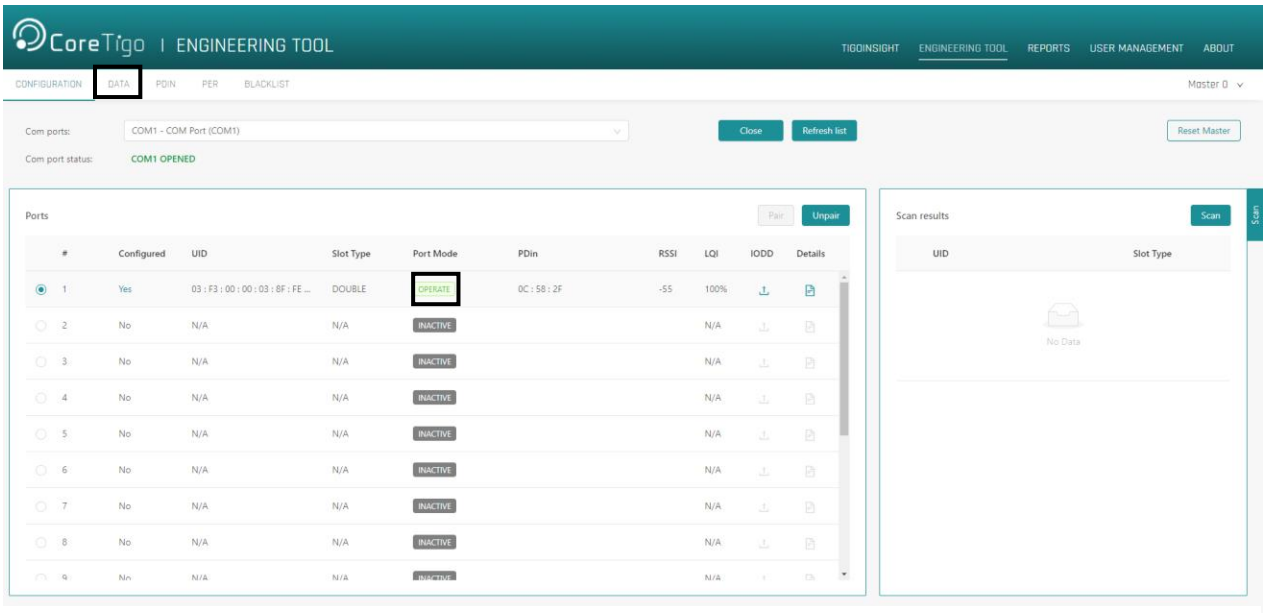

Figure 12 - TigoEngine Operate Mode

6 FW Update

Firmware update can be done over the air using TigoEngine, contact CoreTigo support if needed.

7 Diagnostics and Troubleshooting

Troubleshooting can be done using the LEDs display or the TigoEngine software.

7.1 Power LED

Power LED – if power supply connected to TigoBridge and Power LED is off, power supply is not properly connected or different than the expected power supply range. If power cycle does not help, contact CoreTigo support.

7.2 Status LED

Status LED – indicates the IO-Link device connection status and the IO-Link wireless communication status with the IO-Link master. Hence, it alternates to show both statuses of the IO-Link device connection and the IO-Link wireless connection.

Wireless IO-Link / Wired IO-Link	Paired	Unpaired
Operational	Alternating Blue and Green	Alternating Magenta and Green
Non-Operational	Alternating Blue and Yellow	Alternating Magenta and Yellow

Table 5 - Status LED troubleshooting

- **Alternating Blue and Green** – fully Operational: both IO-Link device and IO-Link Wireless communication properly functioning.
- **Alternating Magenta and Green** – TigoBridge is unpaired to the TigoMaster while the IO-Link device is properly connected to the TigoBridge.
  Re-Scan and Re-Pair the TigoBridge to the TigoMaster through the TigoEngine.
- **Alternating Yellow and Blue** – TigoBridge is successfully paired to the TigoMaster while the IO-Link device is not properly connected or not fully functioning with the TigoBridge.
  Check the IO-Link device connectivity with the TigoBridge.
- **Alternating Magenta and Yellow** – TigoBridge Both IO-Link Wireless communication is unpaired and IO-Link device is not connected / functioning.
  Power cycle the TigoBridge and reconnect IO-Link device, scan and pair the TigoBridge.

8 Guidelines and Regulations

FCC ID: 2ATSM-TGBRIDGEA1

8.1 RF Exposure Warnings

RF Exposure Warnings

This device is only authorized for use in a mobile application. At least 20 cm of separation distance between the (Product Name) device and the user's body must be maintained at all times.

8.2 Class A Warning

The FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense

8.3 Modification Statements

FCC Warning (Modification statement)

CoreTIgo LTD has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user’s authority to operate the equipment.

8.4 FCC Regulatory Notices

Interference statement (if it is not placed in the device)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Wireless notice

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guideline. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

9 Appendix

IO-Link Wireless Masters Alternatives:
All masters are designed to communicate with IO-Link Wireless devices. However, each Master/Gateway has its own IT/OT communication features.

TigoMaster/ TigoGateway	Image	Description
TigoMaster 2TS		IO-Link Wireless Master designed with USB connection.
TigoMaster 2TH		IO-Link Wireless Master designed to communicate both with IT and OT networks. Supports both OPC-UA, MQTT and Industrial Ethernet & Fieldbus protocols.
Evaluation Master		IO-Link Wireless master designed with USB connection to be used as part of PoC or evaluation process. It is part of the TigoStarter Kit.
TigoGateway		IO-Link Wireless Gateway designed with Industrial Ethernet, MQTT, OPC-UA. Supports both LAN and WiFi connections.

Table 6 - IO-Link Wireless Masters/Gateways

10 Customer support

For any issue, question or bug please contact support@coretigo.com